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Challenges in the Evaluation of Social Programs

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# PANES: TARGETING AND IMPACT

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## Abstract

**T**his research paper intends to quantify targeting performance in terms of the efficiency of the National Plan for Social Emergency Assistance (PANES) implemented in Uruguay between 2005 and 2007 and determine its impact on relevant issues such as school attendance, child labor and the labor market. For this analysis, we used 2006 and 2007 Continual Household Survey (ECH) data.

*Our outcomes show that in 2007, 27% of the eligible households in Montevideo and other urban areas were not able to enter the program. In addition, less than 2% of the non-eligible households received program benefits. Even though this allows us to conclude that program targeting was actually not high, targeting indicators show noticeable improvement when compared to indicators for 2006. Additionally, there are no signs of discontinuity around the thresholds set in different regions to gain access to the program. This invalidates the regression discontinuity method used to evaluate program impact.*

*As regards the evaluation, estimates made using the propensity score matching estimator show that PANES has not had significant impact on school attendance or child labor. In addition, adverse labor market effects are observed in terms of worked hours in urban areas other than Montevideo for both men and women. Quantitatively, a reduction in the number of worked hours by individuals who participated in PANES is observed, around 1.4% for men and 8% for women. It is worth mentioning that effects observed on the labor market relate only to worked hours and not to participation in the labor force. As regards informality, a non significant increase is observed. No impacts on the labor supply, labor force participation or informality are observed for Montevideo.*

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*The absence of quantitatively significant effects is not surprising since PANES can be described as a hybrid between food and basic need programs and human capital development programs. Even though the act under which PANES was created establishes eligibility requirements, there is actually no information available on the level of compliance with program requirements (Amarante, Burdín and Vigorito 2008).*

*Finally, our conclusion is that despite the fact that the purpose of PANES was to solve serious problems faced by Uruguayan society, such as indigence, these were only partially solved because PANES seeks a short term solution to a multiplicity of issues such as employment, school attendance, health, etc, addressing them as a whole and solving these issues as a whole is difficult. Although regional conditional transfer policies address several issues as a whole, they focus on only one of them, usually “the accumulation of human capital”, which is considered essential to eliminate inter-generational poverty.*

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Keywords: PANES, conditional cash transfer programs, targeting, propensity score matching.  
JEL classification: I38, J22, H31.

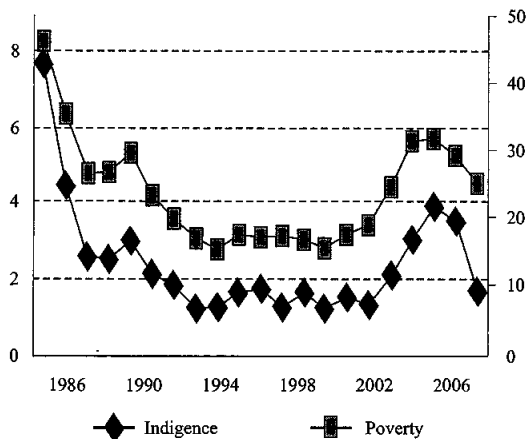
## Introduction

**B**eginning in the 90’s, conditional cash transfer programs became one of the most important social protection tools in most Latin American and Caribbean countries despite the different political and socioeconomic reality of these countries. With similar designs, these programs aim to alleviate poverty in the short-term and increase human capital investment in the long term to reduce intergenerational transmission of poverty trying to avoid negative impacts on the labor supply.

This kind of programs was originated in the new trend of social policies based on social risk management (Rawlings 2002). In theory, these policies are based on the notion of a society exposed to different risks from different sources. In this context, compared to other groups, the exposure of poor sectors to these risks is higher because they have reduced access to or have been directly excluded from institutions that have proven to be effective risk managers and because they show lower levels of human capital accumulation.

In Uruguay, the Plan for National Social Emergency Assistance (*PANES*) was born in 2005 as a means to address the high poverty and indigence levels evidenced in the National Statistics Institute (*INE*) indicators. Even though there was a steep rise in the incidence of poverty and indigence as a result of the 2002 economic crisis, it is worth mentioning that this was not the first time these indicators have registered high values (see Figure 1).

**Figure 1**  
**Poverty and Indigence in Uruguay, 1986-2006**  
 (in%)



Source: Amarante and Vigorito 2006 and Beltrami 2002.

However, during this last period, certain phenomena such as the “infantilization of poverty” worsened and others, such as the “severity of poverty” and the “transformation of indigence into a visible phenomenon”, intensified (De Armas 2004). In addition, considering the period 1987-2002, income distribution indicators for 2002 show the highest concentration levels (Bucheli and Furtado 2004). The greatest inequality is mainly associated to labor market changes occurred in the 90’s, such as an increase in the wage gap according to education level. Among the possible explanations for this greater inequality we can mention the growing opening to trade in the country, changes in productive processes leading to the utilization of highly qualified workers, etc.

These transformations contributed to what is known as chronic poverty, that is, individuals with unsatisfied basic needs who are also below the poverty line. Households who suffer chronic poverty tend to remain in this critical situation for long or undetermined periods; thus, complex policies are required to solve this reality. Therefore, the “State of Social Emergency” was reached not only due to a rise in poverty and indigence levels but also because this new scenario poses increasing difficulties to overcome them.

PANES was suggested as a first effort aimed at mitigating and, to the extent possible, eradicating extreme poverty (indigence) in Uruguay. Unlike other social policy experiences in Latin America, where the duration of the programs is of at least three years in order to achieve beneficiary self-

sufficiency, *PANES* was in effect only two years from the date the act under which it was created was promulgated.<sup>1</sup> Thus, its evaluation represents an essential component of this program since it can contribute to a more efficient allocation of limited fiscal resources in future experiences.

Using *Instituto Nacional de Estadística (INE)* Continual Household Surveys (*ECH*) for 2006 and 2007, we analyze the effectiveness of *PANES* targeting and evaluate its impact. We study the degree to which the program was effectively able to reach its target population and analyze its impact on school attendance (variable it was intended to affect) as well as on other variables which may be indirectly affected by the program, such as child labor and labor force participation. Even though it is not mentioned in any Ministry of Social Development (*MIDES*<sup>2</sup>) document concerning *PANES*, a potential favorable impact of the program was reducing child labor and a potential negative effect was discouraging labor supply in households receiving support under the program.

Even though *INE* household surveys are not specifically designed to collect information on different *PANES* related aspects, their advantage over *MIDES* data is that they do not create incentives to adopt strategic behaviors in order to receive the monetary benefit. For example, in *PANES* records (which are not public records), respondents have greater incentives to under report their income in order to increase their chances of being accepted in the program and receive the benefit. Thus, this work should be considered a complement to other studies aimed at determining the impact of this program.

Since it is not possible to do natural experiments to evaluate the impact of this social policy, quasi-experimental methods such as Regression Discontinuity (RD) or Propensity Score Matching (PSM) must be used. RD requires the strict application of eligibility criteria: Unsatisfied Basic Needs Index (UBNI) and income per capita ceilings. That is, only households whose UBNI exceeded the limits set by the authority responsible for designing the program (in this case *MIDES*) and whose income per capita was below the value determined by law were able to access the program. Had these criteria been actually observed, a discontinuity in the likelihood of receiving treatment would have been observed around the cut-off point set for UBNI. However, no discontinuity is observed around the threshold for program access; thus, from a methodological point of view, it is not possible to use regression discontinuity to evaluate the program. One of the reasons for which no discontinuity is observed could be the result of regrouping, that is, individuals who were first deemed eligible but were no longer eligible because of changes in socioeconomic level or simply due to threshold modifications. To prove this hypothesis, we recalculated targeting performance using data for the first quarter of 2006 where regrouping is less likely to occur and found no significant changes in outcomes.

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<sup>1</sup> When *PANES* concluded, it was replaced by the Equity Program. The latter focuses more on increasing investment in human capital in beneficiary households.

<sup>2</sup> Agency responsible for the implementation of *PANES*.

The reasons for which the thresholds are not observed should be the object of future research and can include, among other: *MIDES* does not appropriately disseminate information about the program benefits among a significant group of eligible households, lack of household interest in participating because of the risk of social stigmatization, administrative and operative difficulties in *MIDES* to determine applicant socioeconomic status, low *PANES* benefit value, etc.

With respect to *PANES* targeting, results<sup>3</sup> show that 27% of the eligible households in Montevideo and other urban areas were not able to enter the program in 2007 and less than 2% of the non-eligible households received the citizen income benefit. These results are an improvement compared to figures for 2006. These targeting figures are similar to those found for other programs applied in the region (Rawlings 2005 and CEPAL 2006).

As regards the evaluation using PSM, estimates show that *PANES* did not have a significant impact on school attendance or child labor. However, adverse labor supply effects are observed in terms of worked hours for both men and women in interior urban parts of the country, where 70% of the beneficiaries reside.

The absence of quantitatively significant *PANES* effects is not surprising since this program could be classified as a hybrid between food and basic need programs and human capital development programs. Even though the act under which it was created establishes eligibility requirements, it seems that in reality control mechanisms were not effective, consistent with outcomes in terms of school attendance.

## 1. PANES

*PANES* can be defined as a group of transitory measures or programs aimed at alleviating the social emergency evidenced by *INE* poverty and indigence indicators (2002 methodology). Thus, it was targeted at the poor in the first quintile that represent 8% of total population in the country, half of which are indigent. They are mostly individuals in structural poverty, that is, individuals with unsatisfied basic needs who are socially marginalized. *PANES* included 337,233 individuals (10.5% of the country's population) or 76,988 households (7.3% of the households in the country).

The origins of *PANES* are directly related to the rise to power on March 1, 2005 of the *Frente Amplio* political party, whose political program included its implementation. The Ministry of Social Development (*MIDES*) was then created on March 21, 2005 through Law 17,866, and Article 9, Paragraph F gave this new agency the power to implement any necessary actions to carry out the program. In addition, *MIDES* was also responsible for monitoring the program.<sup>4</sup>

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<sup>3</sup> For STATA codes used in the estimates, please contact the authors.

<sup>4</sup> *MIDES* presented half-yearly reports to the General Assembly. In addition, official evaluations were presented during the seminar *Hacia la consolidación de estrategias de reducción de la pobreza*, Montevideo, Uruguay, November 12-13, 2007. World Bank officials participated in this seminar.

*PANES* comprised several programs aimed at improving the situation of its beneficiaries in different aspects. On one hand, a cash transfer program known as “Citizen Income” (which included all *PANES* beneficiaries) and an in-kind program known as the “National Food Program” (for households with children or pregnant women) were developed in an attempt to reduce extreme poverty in the short term.

On the other hand, an attempt was made to improve the supply of education and health care services by providing education support in critical areas: “Program for Education in Critical Areas”; and to improve public health services: “Health Emergency Program”. The program “Precarious Settlements and Pensions”, aimed at improving the living conditions of beneficiaries, was also implemented. Building materials were provided to individuals in irregular settlements.

Finally, the programs “Work for Uruguay” and “Ways Out” promoted reinsertion into the labor market to help beneficiaries overcome poverty and indigence in the medium and long term. Enrollment in “Work for Uruguay” was voluntary and participants were selected using a lottery system. The program required working in exchange for 2 Citizen Income benefit payments. The number of participants was reduced (10,748 working positions).<sup>5</sup> “Ways Out” was a six month activity program aimed at providing elements to facilitate the reinsertion of beneficiary households into the labor market as well as other tools for their development. Even though the program was mandatory for selected individuals, it lacked extensive coverage (13,475 participants).<sup>6</sup>

*PANES* most important tool was the “Citizen Income” (*Ingreso Ciudadano*) benefit, implemented as provided in Law 17,869 and Parliamentary Decree 176/005. The implementation strategy for the rest of the programs is not provided for by any act or document. This could have posed difficulties for its implementation and subsequent evaluation since there were no implementation parameters and no information on beneficiary selection criteria. Due to the above and to the fact that the *ECH* mainly includes information on those households that received the Citizen Income benefit,<sup>7</sup> our evaluation will focus on this program.

As regards financing sources, *PANES* was directly financed by general tax revenues. Total expenditure for the program provided by law was 228.5 million US dollars (around 1% of GDP) and this amount was adjusted every four months using CPI. Table 1 shows the amount of resources allocated to each program. The highest budget allocation, two thirds of the budget, went to “Citizen Income”. This reaffirms the notion that cash transfers played a central role in *PANES*.

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<sup>5</sup> Data extracted from [www.mides.gub.uy](http://www.mides.gub.uy).

<sup>6</sup> [www.mides.gub.uy](http://www.mides.gub.uy).

<sup>7</sup> *ECH* also includes information on households that received in-kind transfers and on individuals who participated in “Work for Uruguay”. In the latter case, the number of observations is very low because there were few participants in this program, so an evaluation is not feasible.



**Table 1**  
**2005-2007 Budget**

Program	Amount allocated 2005-2007 (millions of current US dollars)	%
Citizen Income ( <i>IC</i> )	155.5	68
Homeless Assistance Program ( <i>PAST</i> )	1.9	1
Work for Uruguay ( <i>TPU</i> )	24.5	11
Improving our Habitat ( <i>HABITAT</i> )	9.6	4
Building Ways Out ( <i>CRS</i> )	3.5	2
National Food Program ( <i>PAN</i> )	33.5	15
<b>Total</b>	<b>228.5</b>	<b>100</b>

Source: MIDES 2007.

As regards compliance with program requirements, such as regular school attendance and health clinic visits, they help internalize positive externalities in child education and health care which would not be captured otherwise. For *PANES*, requirements included “child enrollment in the formal education system and regular attendance” and “periodical health clinic visits for boys, girls, teenagers and pregnant women”. According to Amarante, Burdin and Vigorito (2007), in practice, there is no information on the level of compliance with program requirements. There is no information on beneficiary follow-ups either.

### Duration

The program was designed to be of 2 years in duration from the date Law 17,869 was promulgated. Cash transfers were retroactive to the date families presented themselves at *MIDES* to register for *PANES*. Most social policy experiences in the region and in Central America provide for a minimum duration of 3 years. This issue has been widely criticized because, in some cases, the time required for beneficiaries to achieve self-sufficiency after the program concludes was not provided.<sup>8</sup> In certain countries, these concerns led to extending the duration of the programs. One example is *Progresa*, currently *Oportunidades*, in Mexico, where more than three years after they entered the program, people living in extreme poverty are still in the program.

<sup>8</sup> Pregnant women in critical areas were to remain in the program for approximately six years to cover their pregnancy and encourage the healthy development of their child during the most vulnerable ages.

On the other hand, programs with long durations are questioned because they can have the undesired effect of creating beneficiary dependence on the benefit. Long programs could also provide an incentive to adopt strategic behaviors (increasing informality and under reporting income) to obtain and maintain the benefit. Thus, some programs in the region provide for cash transfer amounts which decrease over time.

The duration of this kind of social protection policies depends on the particular situation of each beneficiary. The more heterogeneous the target population, that is, greater differences in development levels and living conditions, the harder it is to determine a common duration for all beneficiaries.

These arguments could underline the significance of including exit strategies in transfer policies to strengthen the ability of beneficiaries to overcome poverty while at the same time conveying the idea that these benefits are not of a permanent nature. One of the tools used in exit strategies is making a second evaluation of the beneficiary population to determine whether they are still eligible.

### **Inclusion or access to PANES**

As provided by law and according to the criteria adopted by *MIDES*, there were 2 ways households could gain access to *PANES* in order to receive the citizen income benefit and be eligible for the rest of the programs:

*1) Voluntary inclusion of eligible individuals in accordance with Article 6 of Law 17,869.* Applicants had to present themselves at *Banco de Previsión Social (BPS)* or at *MIDES* to fill in their application form. In the registration form (F1 Registration Form) applicants had to report the number of household members and total income for each member. Family allowances, food baskets and disability and old age benefits were not considered for income calculation purposes. Income reported by each family member was compared with Banco de Previsión Social's administrative records and the higher of the two values was chosen. Average income per person was calculated and compared against 51 US dollars, which, as of March 2005, represented the income ceiling to be eligible for the program. Applicants could be household members over 18 years of age except for households with no adults where minors were responsible for children in the household.

After registration, households whose income per capita did not exceed the income ceiling provided by law were visited by *MIDES* personnel to verify the living conditions of applicants (visit form F2). The Unsatisfied Basic Needs Index for applicant households was calculated based on the information provided on this form. If the UBNI exceeded a certain score determined by the authorities, the household gained access to program benefits. Ultimately, the Ministry could approve or deny entry into the program.

2) *Inclusion of beneficiaries by MIDES through surveys in poor areas.* This criterion points at locating the geographical areas where the target population lived. For Montevideo, the Social Inclusion Observatory identified 12 neighborhoods where 75% of the indigents in the capital reside.<sup>9</sup> *ECH* data and a study made by the Faculty of Economic Sciences and Administration of the University of the Republic were used for the interior of the country. In these areas, *PANES* teams collected the information required (form F1 and F2) to include households that met the requirements provided by law whose UBNI exceeded the threshold for each particular area.

## Citizen Income

Citizen Income (*Ingreso Ciudadano*) was a cash benefit per household equivalent to one Benefit and Contribution Base (*BPC*).<sup>10</sup> It was a monthly cash benefit adjusted every four months using the Consumer Price Index (*CPI*). Households received the Citizen Income benefit for a period of two years from the date the Law was promulgated, retroactive to the date of presentation. The benefit was non-transferable, could not be used as collateral and no deductions could be made, not even for nourishing purposes. It also considered both unipersonal and pluripersonal households, whether family related or not.

*BPS* was responsible for making benefit payments to beneficiaries. Payments were stopped in cases of unjustified non-compliance with program requirements or modifications to eligibility requirements provided in Article 6. According to public information, the eligibility requirements concerning UBNI calculations were modified in September 2005. These modifications resulted in the inclusion of a number of beneficiaries and the exclusion of a reduced number of beneficiaries (Amarante, Arim and Vigorito 2005).

## 2. Experiences in the Region: Comparison with PANES

This section summarizes the main components and outcomes of experiences with this kind of social policies implemented in the region, comparing them with the Uruguayan experience. The main objective is to observe accomplishments and difficulties in other programs to gain a perspective on outcomes to be expected in Uruguay.

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<sup>9</sup> Manga Rural, Cerro Norte, Casavalle, Tomkinson, Borro, La Paloma, Casabó, Bella Italia, Jardines del Hipódromo, Villa García, Bañados de Carrasco and Piedras Blancas.

<sup>10</sup> As of January 1, 2005, one BPC was equivalent to 53 US dollars; as of January 1, 2006, to 61 US dollars and as of January 1, 2007, to 67 US dollars.

## Origin and objectives

In Latin America and the Caribbean, the first experiences with conditional cash transfer policies date back to the mid nineties, particularly in Brazil and Mexico. In Brazil, it begins in 1995 as a municipal policy that is later implemented nationwide as *Bolsa Familia*. In Mexico, this type of policy makes its appearance in 1997 with the implementation of the *Progresa* program, currently *Oportunidades*. Initially targeted at rural areas, it is currently one of the largest programs in the region.

These programs were later implemented in other countries in the region. The Family Allowance Program (*Programa de Asignación Familiar*, phase II) makes its appearance in Honduras in 1998. “Families in Action” (*Familias en Acción*), in Colombia and “My Family Social Protection Network” (currently *Red Solidaria*), in Nicaragua, are born in 2000. In Jamaica, the “Programme for Advancement Through Health and Education” and in Chile, the “Chile Social Protection Solidarity System” (*Chile Solidario*) were launched in 2002. In Ecuador, “Human Development Bonus” (*Bono de Desarrollo Humano*) is introduced. In Argentina, “Families for Social Inclusion” (*Familias para la Inclusión Social*), in Paraguay, “Social Promotion and Protection Network” (*Red de Protección y Promoción Social*), in Peru, “Together Program” (*Programa Juntos*) and in the Dominican Republic, “Solidarity Card” (*Tarjeta Solidaria*), are implemented in 2005. Several of these programs were financed by the World Bank and the Inter-American Development Bank (IDB).

These experiences were originated by the economic crisis and the deep demographic and socioeconomic changes experienced in the region at the end of the 20th century (Cecchini and Uthoff 2007), in conjunction with the crisis in the traditional social policy model. It is worth mentioning that despite the political, cultural and social differences among countries, similar schemes were adopted by these programs. Their goal is to alleviate poverty in the short term and encourage the accumulation of human capital in the long term through conditional transfers (see Table 2).

**Table 2**  
**Conditional Cash Transfer Programs: Objective and Target Population**

Program	Objective	Target population
<i>Bolsa Familia</i> <b>Brazil</b>	Reducing poverty and inequality in the short and long term.	Families with children in extreme poverty: monthly income per capita below 27.24 US dollars. Families with children in moderate poverty: monthly income per capita between 27.64 and 55.68 US dollars.
<i>Oportunidades</i> (formerly <i>Progresas</i> ) <b>Mexico</b>	Improving the skills of families in extreme poverty through human capital investments in education, food and health.	Families with insufficient income per capita to purchase the <i>INEGI-CEPAL</i> normative food basket and families with insufficient income per capita to meet basic food, health and education needs. And in addition, there should be children or teenagers in the household.
Human Development Bond <b>Ecuador</b>	Improving human capital formation among the poor in Ecuador.	Families with children under 15 years of age whose basic needs are unsatisfied.
Families in Action <b>Colombia</b>	Protecting and encouraging human capital formation in children aged 0 to 17 who belong to poor households by helping families invest in health care, nutrition and education.	Poor rural and urban households ( <i>SISBEN 1</i> ) with children under 18 years of age who are not Community Home ( <i>ICBF</i> programs) or Work in Action beneficiaries.
Families for Social Inclusion <b>Argentina</b>	Promoting child development, health and education as well as preventing poor households from being excluded.	Poor families with children under 19 years of age or pregnant women that do not receive subsidies from other social programs.
Chilean Social Protection Solidarity System <b>Chile</b>	Providing integral support to indigent families and families in critical poverty.	Indigent families.
Social Promotion and Protection Network <b>Paraguay</b>	Satisfying the basic needs of families in extreme poverty and creating opportunities for them to develop their potential.	Families in extreme poverty with children aged 0 to 14 and pregnant women.

**Table 2 (continued)**

<b>Program</b>	<b>Objective</b>	<b>Target population</b>
Solidarity Card <b>Dominican Republic</b>	Reducing extreme poverty and hunger.	Population in extreme poverty identified using <i>SIUBEN</i> (Single Beneficiary Identification System).
Together Program <b>Peru</b>	Alleviating poverty in the short term and helping beneficiaries attain self-sustainable levels of income and well being in the medium term.	Socially excluded families in extreme poverty with children aged 14 and/or expectant mothers.
Solidarity Network <b>Salvador</b>	Improving the living conditions of families in extreme poverty, focusing on rural areas, enhancing their economic opportunities providing them the necessary resources to develop their skills.	Families in extreme poverty living in the 100 municipalities with the highest marginalization rates.
Family Allowance Program <b>Honduras</b>	Increasing poor children's human capital helping them to break the circle of poverty.	Poor families with: children aged 6-12 who have not finished fourth grade; children under 3 years of age; disabled children up to 12 years of age; pregnant women; older adults over 60.
Programme for Advancement Through Health and Education <b>Jamaica</b>	Increasing educational and health achievements, reducing child labor and overcoming poverty.	Poor families with a) children aged 0-17, b) pregnant or nursing women and c) older adults and disabled individuals.
My Family Social Protection Network <b>Nicaragua</b>	Encouraging the accumulation of human capital in terms of education, nutrition and health in children from poor families.	Children 0 to 13 years of age from poor families. Children over 6 years of age should be enrolled in basic education.
National Plan for Social Emergency Assistance Social <b>Uruguay</b>	Providing households participating in <i>PANES</i> the opportunity and the tools to overcome extreme poverty and social and economic exclusion in the medium term. Implementing strategies to prevent households from falling into indigence again.	Targeted at individuals or households in extreme poverty the plan's target population is made up by individuals in the first quintile of poor people living below the poverty line.

Sources: Villatorio Saavedra 2007 and MIDES 2005.

In addition, the role women play as the party responsible for managing the benefit and the technical nature of targeting and evaluation strategies are common characteristics among programs. Even though the ultimate objective of all programs is to reduce poverty and increase education levels, each country focuses on the aspect of poverty where an intervention is required to reduce poverty. Consequently, they determine different target populations.

Something that is essential to be able to achieve the objectives of conditional transfer programs regardless of their focus of interest (reducing current poverty levels, human capital accumulation in the long term) is sufficient sectoral supply. Some countries have opted for supply side subsidies to ensure adequate institutional responses to satisfy potential increases in the demand for services.

### **Transfers and conditions**

Economists believe cash transfers are better than in-kind transfers because in-kind transfers restrict people's behaviors while cash transfers do not. Nonetheless, we see that in-kind transfers are used in a large number of countries so there must be important theoretical reasons to do so.

The first and most important explanation is parental attitude. Parents do not take into account how their children could benefit when making decisions regarding their education and thus, under invest in education. There could also be preference interdependence and high income individuals who pay taxes to finance low income individuals profit from their consumption of certain goods such as education. A second explanation could be that governments are unable to clearly identify program beneficiaries and therefore resort to in-kind transfers (of inferior goods) for individuals to self-select themselves so only low income individuals will consume this good. A last reasonable justification for in-kind transfers has a political nature. De Janvry, Fargeix and Sadoulet's (1992) empirical experience shows that in-kind transfers are more politically accepted and therefore more likely to be carried out by democratic governments. Table 3 presents benefits transferred under different programs in Latin America and the Caribbean.

**Table 3**  
**Conditional Transfer Programs. Transfer, Requirements and Verification**

<b>Program</b>	<b>Transfer</b>	<b>Requirements</b>	<b>Requirements verification</b>
<i>Beca Familia</i> <b>Brazil</b>	Base amount, 23.03 US dollars (regardless of family composition). Variable amount, 6.91 US dollars per child under 15 years of age, up to 20.73 US dollars (3 children).	Children aged 6-15 must attend at least 85% of classes. Pregnant women and children under 7 years of age must attend health care and nutrition scheduled appointments.	Program Coordination Units must inform the Executive Secretariat whether requirements are being met.
<i>Oportunidades</i> <b>Mexico</b>	Education: 10-63 US dollars per child/month (according to age and gender). Health/Nutrition: 15 US dollars per month per family. Nutritional supplements for children and pregnant or nursing mothers.	School enrollment. 85% attendance rate. Enrolling youths up to 21 years of age in high school and helping them make adequate academic progress.	Sectors inform state managers whether requirements are being met and they, in turn, forward this information to the central government. The information is entered in the beneficiary roster and transfers are authorized.
Human Development Bond <b>Ecuador</b>	15 US dollars per family/month.	School enrollment and attending 90% of school days in a month. Children must receive health checks twice a month.	As of 2006, the program had no mechanisms to verify compliance.
Families in Action <b>Colombia</b>	Education: 7.50 US dollars per child in primary school, 15 US dollars per child in secondary school. Health/Nutrition: 25 US dollars per family with children under 7 years of age.	80% attendance rate. Regular health care visits to monitor children's growth and development.	Monitored twice a month by an independent entity.
Families for Social Inclusion <b>Argentina</b>	36 US dollars for first child. 9 US dollars per child for the rest of the children, up to 5. Maximum 72 US dollars per family.	School and health center attendance.	Monitored twice a year. Vaccination, pregnancy care, enrollment and school attendance certification is required.
<i>Chile Solidario</i> <b>Chile</b>	Social Protection Bond: 15 US dollars 1- 6 months; 11 US dollars, 7-12 months; 7.80 US dollars, 13-18 months; 5 US dollars, 19-24 months.	Achieving goals set forth in the social/family intervention agreement. Includes goals related to education, health, identification, habitability, family dynamics, monetary income and work.	Family support workers visit the household and gather information on progress made by families in achieving the goals established in the family agreement.



Table 3 (continued)

Program	Transfer	Requirements	Requirements verification
Family Allowance Program <b>Honduras</b>	Education: 3 US dollars per month per child up to a maximum of 3 children per family during the 10 month school year. Health/Nutrition: 3 US dollars per month per child under 3 years of age, disabled child up to 12 years of age, pregnant woman and older adult.	Maximum number of school absences: 7 days. Health center attendance.	-
Program for Advancement through Health and Education <b>Jamaica</b>	Education: 6.20 US dollars (2002); 9 US dollars (2004). Health/Nutrition: 6.20 US dollars (2002); 9 US dollars (2004).	85% attendance. Health center attendance.	-
Solidarity Card <b>Dominican Republic</b>	-	85% attendance. Periodical health center visits.	-
Social Protection Network <b>Nicaragua</b>	8.50 US dollars per child per month. 20 US dollars per year for every child who finishes the school year. It was recently decided that the value of the food bond will decrease over time.	Less than 6 unjustified absences. Attending health centers, health and nutrition workshops. Keeping children's vaccinations up to date.	Verified through <i>SEMP</i> .
National Plan for Social Emergency Assistance <b>Uruguay</b>	A fixed amount of approximately 58 US dollars per household. An additional amount for food which varies between 12 and 33 US dollars depending on the number of children or pregnant women in the household.	Enrollment in the formal education system and regular attendance. Periodical doctor visits for boys, girls, teenagers and pregnant women. Participating in community activities.	The Ministry of Social Development forwards a half yearly report on <i>PANES</i> performance to the General Assembly.

Sources: Villatorio Saavedra 2007 and MIDES 2005.

In certain countries, the benefit consists of a fixed amount and an additional variable amount. Transfers are usually determined in terms of the value of the poverty line or the poverty gap, seeking to transfer the amount required by individuals or households to satisfy their basic needs (Handa and Davis 2006).

In Uruguay, transfers included a fixed amount per household and a variable amount for food assistance. The Citizen Income benefit was slightly higher than the price of the Basic Food Basket (*CBA*) for Montevideo, the basket used in determining the line of indigence for the capital. In other areas, the value of the *CBA* is lower so the amount by which cash transfers exceeded its value was higher. Consequently, our evaluation of the impact on indigence reduction should consider that the chances of reducing the indigence gap for individuals who reside in the capital would be lower.

The disadvantage of fixed cash transfers is that they are not adequate for large families. In these cases, the amount transferred could be insufficient to encourage the accumulation of human capital since liquidity restraints are greater. Mention must be made that *PANES* coexisted with other cash transfer programs (Family Allowances) where a small amount of cash, variable according to the number of children, was transferred twice a month.<sup>11</sup> 76% of the households that received the Citizen Income benefit also received Family Allowance transfers.

The way to determine the benefit amount varies significantly among countries. In Mexico, the benefit amount is higher for households with children in secondary school. This reflects that the opportunity cost of working when they grow up will be higher for these minors. In other programs, the benefit amount decreases over time (monthly periods).

Eligibility requirements are similar among the different programs in Latin America and the Caribbean. However, requirement verification methods are different for all the programs. In certain cases, independent entities are involved.

## Evaluation

Impact evaluations have shown that these programs are effective mechanisms to promote access to and utilization of education and health services among the poorest as well as to alleviate poverty in the short term. But it is still not clear whether these initiatives are sufficient to reduce poverty in the medium term and break the circle of poverty in the long term (Rawlings and Rubio 2003).

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<sup>11</sup> Replaced by the Equity Program (*Plan de Equidad*) in 2008, where benefits are higher than under family allowances and are paid monthly.

At the same time, similarities in the design of programs implemented throughout the region evidence the need to underline that these mechanisms should not be understood as an automatic solution to all the expressions of poverty regardless of the specific context of each country and the needs of beneficiary populations.

A key element in transfer programs is that it be feasible to conduct an adequate evaluation. This is why programs implemented in Mexico (Parker and Teruel 2005) and Nicaragua (Barham and Gitter 2008) emphasized evaluation from the very moment the program was being designed and implemented, collecting data from individuals both before and after the program.

Since it would have not been possible to observe beneficiary outputs had they not participated in the program, the best way to make an effective evaluation is by randomly selecting participants in certain regions to construct a control group that is directly comparable with the treatment group and thus be able to effectively measure the program impact. This random selection of participants was made in programs implemented in Mexico and Nicaragua. However, we were not able to find any explicit program evaluation mechanisms in the design of *PANES*. Not having taken into account the creation of a valid control group since the beginning limits the possibility of conducting an evaluation. So in order to quantify the impact of *PANES* we had to use quasi experimental techniques such as regression discontinuity, as long as selection thresholds were observed, or matching estimators, a procedure used to search for a control group similar to the treatment group.

### 3. Targeting

#### 3.1 Methodology applied in PANES

Law 17,869 (2005), under which *PANES* was created, defines its target population as the first quintile of individuals under the *INE* poverty line in 2004. To incorporate the target population into the program, two targeting criteria were defined: (i) income ceiling; and (ii) unsatisfied basic needs index. Household income per capita should not exceed 51 US dollars as of March 2005, adjusted every four months using CPI.<sup>12</sup> The second criterion, the unsatisfied basic needs index, is presented below.

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<sup>12</sup> Family allowances, disability and old age pensions and other social security benefits are not included in income per capita calculations.

## Unsatisfied Basic Needs Index

The Unsatisfied Basic Needs Index (UBNI) was prepared by the University of the Republic in collaboration with the Ministry of Social Development.<sup>13</sup> This criterion became necessary because using income as the only deprivation measure would represent a univariate vision of a reality that involves more than one dimension. Thus, another mechanism which included different dimensions and was capable of solving under declaration and volatility issues which arise when using income, was incorporated.

UBNI is calculated as follows,

$$UBNI_i = N \left( \sum_k X_{ik} \beta_k \right)$$

where  $i$  refers to households;  $N$  is the function of accumulated distribution of the standard normal distribution;  $X_{ik}$  is a vector of  $K$  variables selected based on the estimation of a probit model where the dependent variable is a dummy that takes the value of one if the household belongs to the first quintile of poor people according to the *INE* poverty line (methodology 2002) and zero if the household is poor but does not belong to the first quintile; and  $\beta_k$  are the coefficients associated to each variable. For Montevideo and other urban areas, the independent variables are the following.

- *Publich*: binary variable that indicates that there is at least one public servant in the household.
- *Retireeh*: binary variable that indicates that there is at least one retiree in the household.
- *Pensionerh*: binary variable that indicates that there is at least one pensioner in the household.
- *Healthh*: binary variable that indicates that at least one household belongs to a *mutualista*.
- *Members*: logarithm of the number of household members.
- *Children under 5*: binary variable that indicates that there are children aged 0-5 in the household.
- *Children between 12 and 17*: binary variable that indicates that there are teenagers aged 12-17 in the household.

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<sup>13</sup> Amarante, Arim and Vigorito 2005.

- *Wealth*: variable constructed using factorial analysis assumed to approximate the wealth of the household. Index calculations are detailed in Annex 1.
- *Educational environment*: average education, in number of years, of adults in the household, except in cases where there are no individuals over 18 years of age in the household.
- *Overcrowded*: binary variable that indicates that the household is overcrowded (more than two persons per bedroom).
- *Sewagem 1*: binary variable that indicates that the household has no bathroom.
- *Sewagem 3*: binary variable that indicates that the household has a bathroom with a sewage disposal tank or septic tank.
- *Sewagem 4*: binary variable that indicates that the household has a different sewage disposal system. This variable applies only for Montevideo.
- *Sanint1*: binary variable that identifies that the household has no bathroom. This variable only applies to urban areas other than Montevideo.
- *Sanint3*: binary variable that identifies that the household has a different sewage disposal system. This variable only applies to urban areas other than Montevideo.
- *Rent*: binary variable that indicates that the family rents the house. This variable only applies to Montevideo.
- *Occupied*: binary variable that indicates that the household is occupied. This variable only applies to Montevideo.
- *Year*: binary variable used to distinguish between 2003 and 2004 observations.
- *Constant*.

The following independent variables are used for rural areas:

- *No cistern*: binary variable used to distinguish households that have no water cistern.
- *Household 1*: binary variable that indicates that the household is unipersonal.
- *Household 2*: binary variable that indicates that the household is made up of a childless couple.
- *Household 3*: binary variable that indicates that the household is monoparental.
- *Household 4*: binary variable that indicates that the household is nuclear (couple with children).

- *Household 5*: binary variable that indicates that it is a compound household (nuclear household and other relatives).
- *Household 6*: binary variable that indicates that it is an extended household (nuclear or compound household and non-relatives).
- *Overcrowded*: binary variable that indicates that the house is overcrowded (more than two persons per bedroom).
- *Wealth*: variable constructed using factorial analysis to approximate wealth in the household. Index calculations are detailed in Annex 1.
- *Masonry*: binary variable that indicates that the house has masonry walls.
- *Cement floor*: binary variable used to distinguish houses with cement floors.
- *Dirt floor*: binary variable used to distinguish houses with dirt floors.
- *Children aged 0 to 4*: number of children aged 0 to 4 in the household.
- *Children aged 5 to 10*: number of children aged 5 to 11 in the household.
- *Children aged 11 to 17*: number of children aged 12 to 17 in the household.
- *Members*: logarithm of the number of household members.
- *Retireeh*: binary variable that indicates that there are retirees in the household.
- *Mutualista head*: binary variable that indicates whether the head of the household belongs to a *mutualista*.
- *Education head*: binary variable that indicates whether the head of the household finished primary school.

For Montevideo and other urban areas, the probit model was estimated based on the Continual Household Survey (*ECH*) data for 2003 and 2004 and for rural areas, based on Household Income and Expense Survey (*EGIH*) data for 1999.<sup>14</sup> The objective of *ECH* is to provide an adequate description of the socioeconomic situation of the Uruguayan population; it is the main source of socioeconomic data nationwide. These surveys are administered throughout the year with the purpose of generating an adequate description of the activities and socioeconomic characteristics of the Uruguayan population. Information in  $X_{ik}$  variables used to calculate applicant UBNI was obtained from the *MIDES* visit form (F2). Cut off points or “thresholds” for the different areas (Table 4) were defined after UBNI had been calculated.

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<sup>14</sup> *EGIH* was conducted by the Office of Planning and Agricultural Policy, Ministry of Livestock, Agriculture and Fishing (*OPYPA*, *MGAP*). The survey includes 2,000 household in areas with a population under 5,000.

**Table 4**  
**Thresholds by Region**

<b>Region</b>	<b>Threshold</b>
Montevideo	0.191
Northern Urban Areas	0.085
North Central Urban Areas	0.055
South Central Urban Areas	0.067
Southern Urban Areas	0.098

*Source:* Amarante, Arim and Vigorito 2005.

Households in these regions that exceeded the threshold were eligible according to this criterion. Urban areas other than Montevideo were divided in 4 different areas: North, which includes the Department of Artigas, Salto and Rivera; North Central, which includes Paysandú, Rio Negro, Tacuarembó, Duranzon, Treinta y Tres and Cerro Largo; South Central, which includes Soriano, Florida, Flores, Lavalleja and Rocha; and finally, South, which includes Colonia, San José, Canelones and Maldonado. It is worth noting that Amarante, Arim and Vigorito (2005) do not determine the value of the poverty line or the thresholds used for rural areas. Based on the UBNI criterion, there are 60,000 eligible households. However, since around 80,000 households had access to this program, we can conclude that this criterion was not fully enforced (MIDES 2006).

A controversial aspect of the methodology used to determine eligibility is the definition of the binary dependent variable in the probit model. Even though this targeting tool was used to avoid problems associated to using income as a variable for beneficiary selection, in this particular case, the dependent variable in these models is constructed based on household income per capita, representing circularity. That is, households below the poverty line were grouped in quintiles based on their income per capita to be able to visualize those in the first quintile. Hence, some of the problems associated to using income per capita would have been captured in this criterion.

On the other hand, a positive aspect of the model was its stability over time. This can be inferred from new estimates made using 2006 and 2007 *ECH* data (see Table 5). Coefficient signs remain the same and a high correlation is observed between the UBNI developed using the coefficients estimated in this paper and the UBNI using Amarante, Arim and Vigorito (2005) coefficients. The correlation coefficient between the model estimated in this paper and Amarante, Arim and Vigorito's model is 0.97 for Montevideo and 0.98 for other urban areas.

**Table 5**  
**Unsatisfied Basic Needs Index**

Variables	Coefficients (Montevideo)		Coefficients (other urban areas)	
	(a)	(b)	(a)	(b)
dummy_2007	0.081**	-	-0.057**	-
publich	-1.101**	-1.206	-0.853**	-1.645
retirech	-0.765**	-0.758	-0.613**	-0.580
pensioerh	-0.440**	-0.321	-0.578**	-0.521
healthh	-1.314**	-0.902	-1.059**	-1.098
members	0.968**	1.182	0.474**	0.625
children aged 0- 5	0.184**	0.274	0.195**	0.109
children aged 12-17	0.118**	0.102	0.151**	0.076
wealth	-0.467**	-0.436	-0.339**	-0.237
educational environment	-0.023**	-0.068	-0.024**	-0.038
overcrowdedh	0.232**	0.137	0.206**	0.133
sewage 1	0.3139**	0.232	-	-
sewage 3	0.058*	0.091	-	-
sewage 4	0.429**	0.220	-	-
sanint1	-	-	0.255**	0.175
sanint3	-	-	0.170	0.459
rent	0.195**	0.457	-	-
occupied	0.074**	0.312	-	-
constant	-2.445**	-2.967	-1.782**	-2.291
year	-	0.139	-	0.156
<b>Number of observations</b>	13,397	16,357	14,111	16,231
<b>Pseudo R<sup>2</sup></b>	0,352	0,361	0,190	0,206

Note: (a) This paper's estimates; (b) Amarante, Arim and Vigorito's 2005 estimates.

\* Statistically significant at the 10% level; \*\* statistically significant at the 5% level.

Source: Own elaboration based on ECH data for 2006 and 2007 and Amarante, Arim, and Vigorito 2005.



### 3.2 Analysis based on ECH 2006-2007

To analyze program impact on school attendance, child labor and the labor market we used the Uruguayan National Household Survey (*ECH*) conducted by the National Statistics Institute (*INE*). We used countrywide cross sectional data for 2006 and 2007.

An innovation in *ECH* 2006 is the incorporation of several sections on different topics such as Housing, Education, Child Labor, Family, Migration, International Migration and Information and Communication Technology increasing the number of individuals surveyed and the fields of research. Some of these topics are also included in *ECH* 2007.

*ECH* 2006 includes 256,866 individuals who make up 85,316 households. 5.4% of the households received the Citizen Income benefit, and of these, 41% also received food assistance under the program.<sup>15</sup> In addition, 0.2% of the total number of households participated in the Work for Uruguay Program. *ECH* 2007 surveys 143,185 individuals from 49,136 households. The percentage of households that received the citizen income benefit was 5.7%. The number of families receiving food assistance grew until 84% of the households receiving the citizen income benefit were also receiving food assistance. As regards the Work for Uruguay Program, the number remained unchanged for 2007.

*ECH* surveys ask whether households were receiving the citizen income benefit under *PANES*. Even though these surveys are not specifically designed to collect information on the various aspects of *PANES*, their advantage over *MIDES* is that they do not generate an incentive to adopt strategic behaviors in order to receive the monetary benefit. Thus, for example, in *PANES* records (which are not of public access) respondents have greater incentives to under report their income in order to increase their chances of being accepted in the program and receive the benefit. Therefore, this paper should be seen as a complement to other studies that seek to determine the program's impact. Table 6 presents the distribution of beneficiary households by region and by year.

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<sup>15</sup> 100% of the households that received food assistance under *PANES* received the Citizen Income benefit.

**Table 6**  
**Distribution of PANES Beneficiary Households by Region**

Region	2006		2007	
	Beneficiary households	Percentage	Beneficiary households	Percentage
Montevideo	17,022	27	16,981	25
Northern Urban Areas	9,897	16	10,542	15
North Central Urban Areas	12,753	21	13,119	19
South Central Urban Areas	6,961	11	7,163	11
Southern Urban Areas	12,429	20	15,077	22
Rural Areas	2,891	5	5,217	8
<b>Total</b>	<b>61,953</b>	<b>100</b>	<b>68,098</b>	<b>100</b>

Source: Own elaboration using ECH 2006-2007 data.

Despite the fact that since 2002 indigence rates have been higher in Montevideo than in other urban areas (Amarante and Vigorito 2006), the Emergency Plan focused on the interior of the country. In 2007, 75% of the beneficiary households were located in the interior of the country. It is worth mentioning that this characteristic of *PANES*, focusing on the interior of the country, is similar to the distribution of scholarships to attend to the University of the Republic (*UDELAR*) granted by the Solidarity Fund, where 90% of the beneficiaries are from the interior of the country. This targeting issue could be the result of having set one single countrywide income ceiling; this is, not taking into consideration differences in the cost of living between the capital and the rest of the country. Hence, it should have been expected (as data confirms) that a larger number of families in urban areas in the interior of the country would not exceed this ceiling, as opposed to those who lived in the capital. In addition, according to *INE* data as of December 2007, average income (not including Christmas bonus or owners' equivalent rent) for households in Montevideo is 46% higher than in the interior of the country (1,145 US dollars vs. 784 US dollars).

With respect to targeting in Montevideo and other urban areas, for 2006 we observe that 62% of the eligible households received the cash benefit; this is horizontal efficiency (see Table 7); while 38% of those who were eligible did not receive the benefit. In 2007, there was a 10% increase in horizontal efficiency, from 62% to 72%, indicating targeting efforts had improved.

As for non-eligible households that received the cash transfers, they represented 1% both in 2006 and 2007. That is, vertical efficiency was 99% for both years. In rural areas, considering only the income criterion since there is no information available on UBNI thresholds for these areas, 76% of the eligible households did not receive the cash benefit; this figure decreases to 55% in 2007 (see Table 8).

**Table 7**  
**PANES Target Population, Montevideo and Other Urban Areas**  
(in %)

	2006		2007	
	Eligible	Non-eligible	Eligible	Non-eligible
Received Citizen Income benefit	62	1	72	1
Did not receive Citizen Income benefit	38	99	28	99
<b>Total</b>	100	100	100	100

Source: Own elaboration using *ECH* 2006-2007 data.

**Table 8**  
**PANES Target Population, Income Criterion Only, Rural Areas**  
(in %)

	2006		2007	
	Eligible according to income	Non-eligible according to income	Eligible according to income	Non-eligible according to income
Received Citizen Income benefit	24	1	45	2
Did not receive Citizen Income benefit	76	99	55	98
<b>Total</b>	100	100	100	100

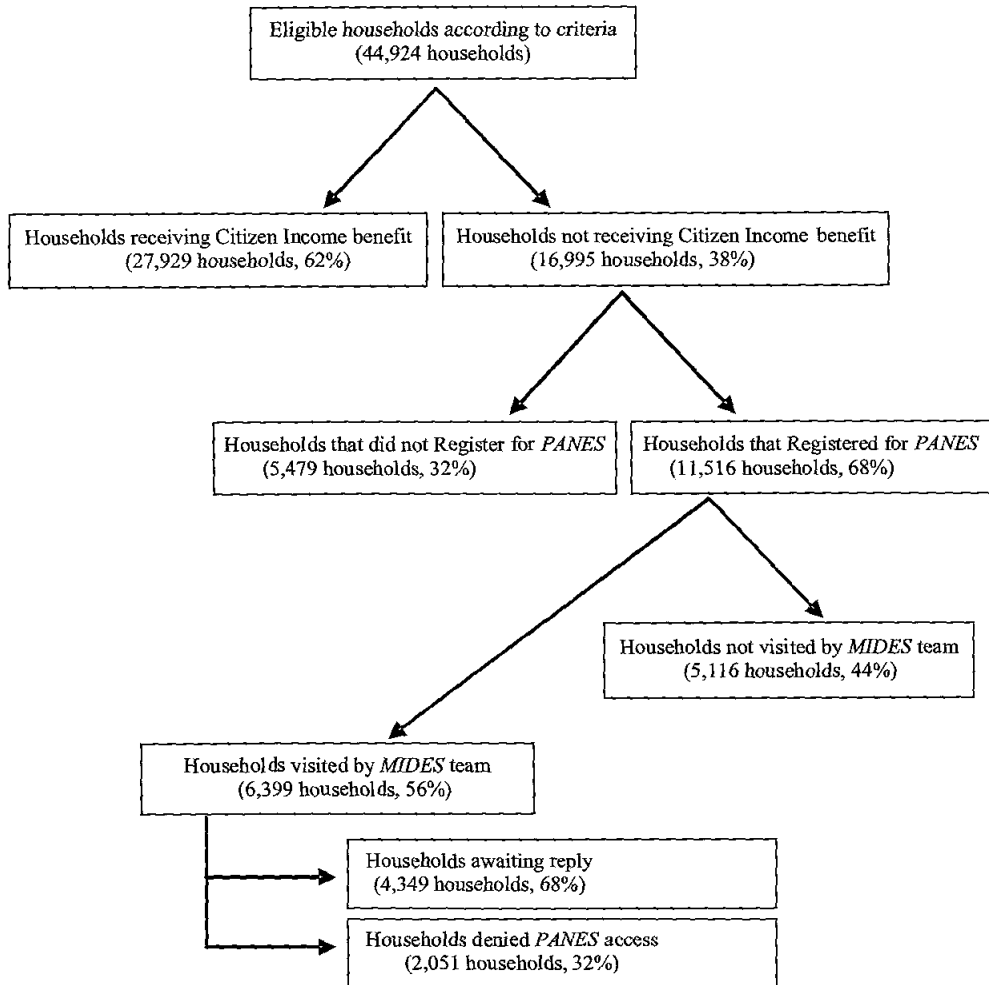
Source: Own elaboration using *ECH* 2006-2007 data.

To make a comprehensive analysis of targeted households (in Montevideo and other urban areas) that did not receive the cash benefit, using *ECH* 2006-2007 data, we investigated whether these households had registered for *PANES* and whether they had been visited by *MIDES* technical staff after registration.

In 2006, 62% of these households registered for the program while the remaining 38% did not (see Figure 2). That is, over one third of potential beneficiaries decided not to apply. Among registered households, 56% was visited by *PANES* poll-takers while 44% was not. This figure reflects the number of households that had been found not eligible by *MIDES* according to the income per capita criterion (form F1). Households in this group have an average UBNI of 0.285, an average income per capita of 37 US dollars and 72% of these households have members who work in the informal labor market.

Among visited households, 32% was denied access to the program and 68% were still awaiting reply. The former have an average UBNI of 0.225, an average per capita income of 37 US dollars and 76% of the households have members who work in the informal labor market. The group awaiting reply has an average UBNI of 0.260, an average income per capita of 34 US dollars and 68% of the households have members who work in the informal labor market.

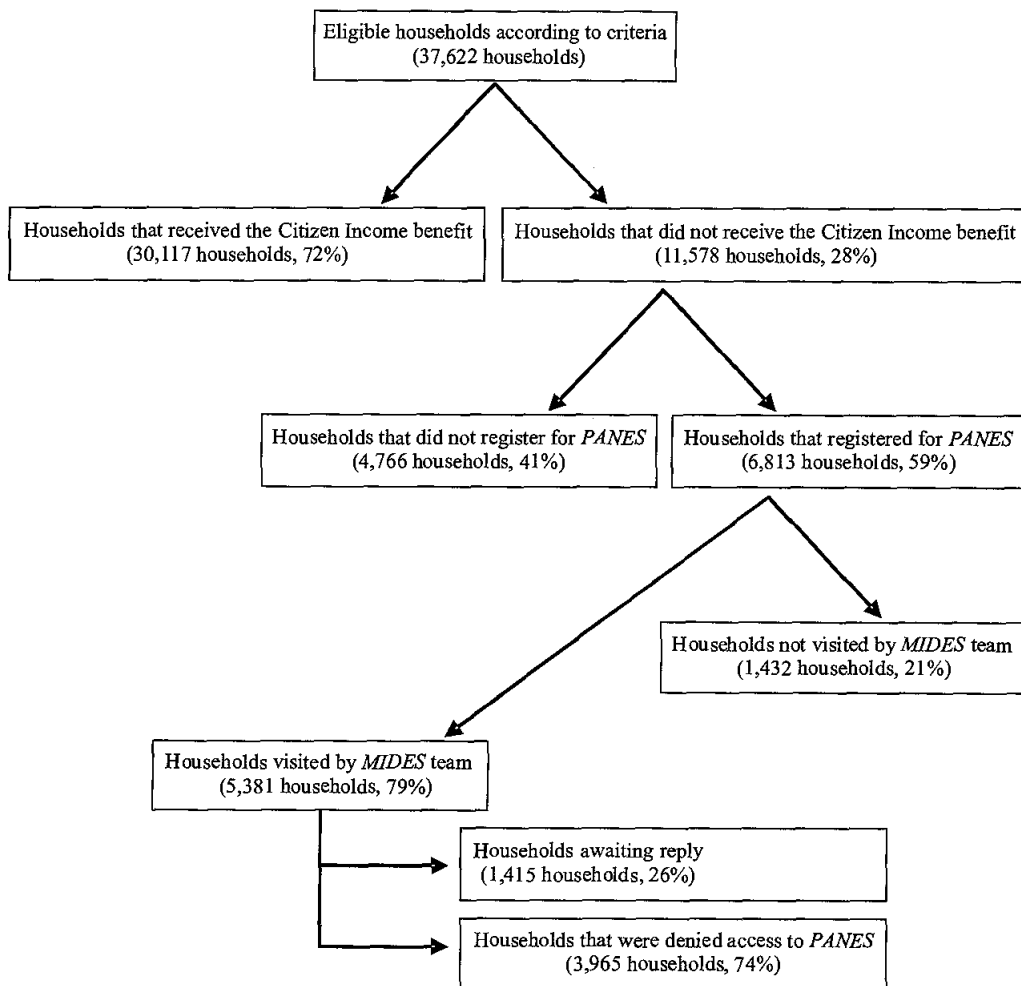
**Figure 2  
2006**



For 2007, the number of households that did not register and did not receive any cash transfers increases to 41% (see Figure 3). Among registered households (that did not receive any cash transfers) the percentage of visited households increases to 79%. This implies that the number of households rejected as a result of the first filter (household income per capita) decreased.

Among visited households, 74% were rejected and 26% were awaiting reply. In this case, the number of households that did not satisfy the UBNI criterion increased. Rejected households have an average UBNI of 0.233, an average income per capita of 42 US dollars and 89% of the households have members who work in the informal labor market.

Figure 3  
2007



The values observed indicate that targeting strategies were more effective in urban areas where it seems there were fewer difficulties in identifying the target population. Nonetheless, a number of target households were not included in the program. It seems targeting performance was not very good in rural areas where the population is more disperse and specific targeting criteria are required.

In addition, figures observed for this section indicate that the main challenge of these programs is capturing the target population that does not enroll voluntarily. This is evidenced by the fact that as horizontal efficiency increases, the number of eligible individuals who did not register grows. Future transfer program targeting criteria should provide for improved mechanisms to include the target population who adopts a passive role with respect to these policies.

*PANES* targeting performance is similar to other programs applied in the region (Rawlings 2005 and CEPAL 2006).

## 4. Methodology

A critical issue in estimating the impact of conditional cash transfer (CCT) programs such as *PANES* is controlling for endogeneity. The households that are receiving assistance under CCT programs do not represent a random sample since beneficiary inclusion depends on the eligibility criteria determined by those responsible for implementing these policies.<sup>16</sup> To solve the issue of endogeneity and since natural experiments are not possible, quasi-experimental methods must be used.

In this case, the choice of an evaluation methodology is strongly linked with the program eligibility criteria. The mechanism adopted by the program—unsatisfied basic needs index, which could be considered a proxy mean test—requires using the regression discontinuity approach. In this sense, Regression Discontinuity (RD) is defined as a quasi-experimental design used when treatment is determined based on rules established by the entity responsible for the administrative aspects of the program.

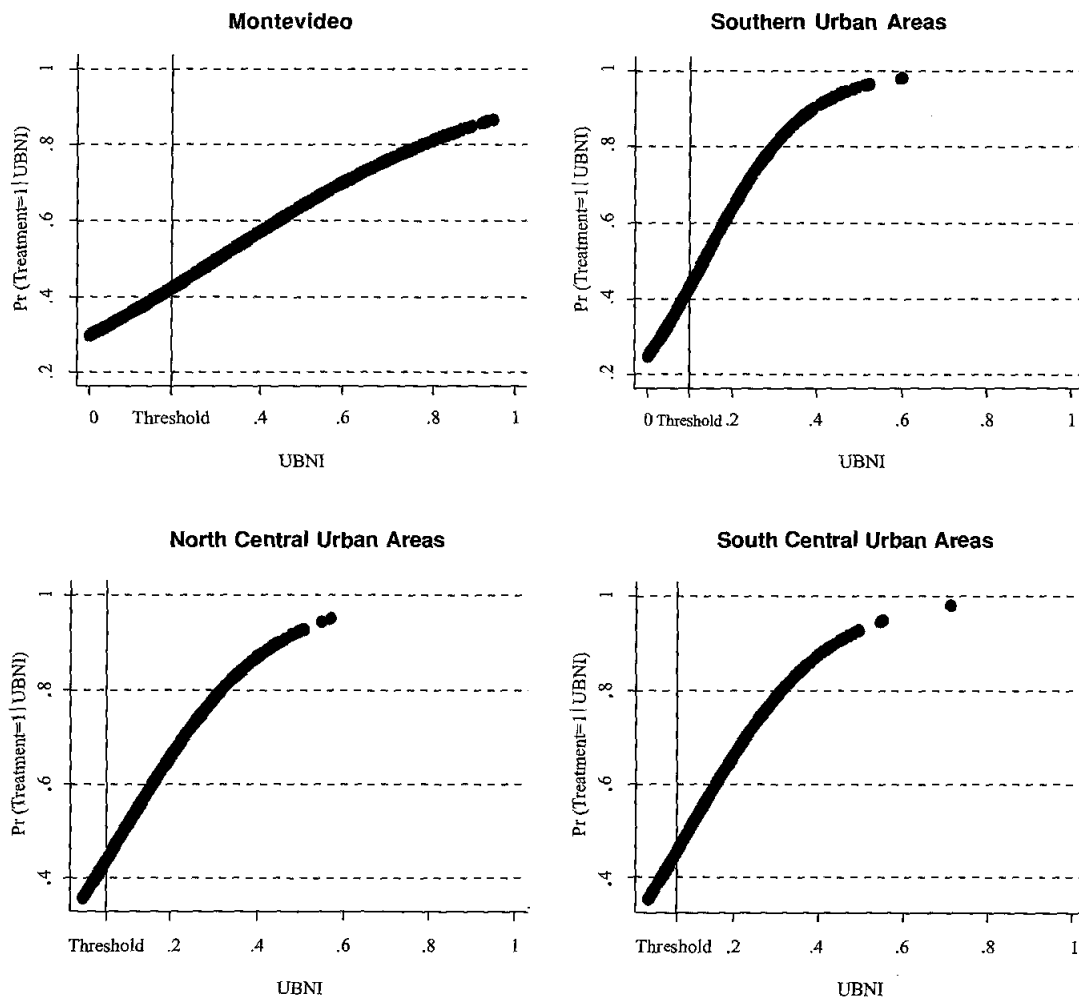
In addition, applying this evaluation method requires that the probability of receiving treatment conditional on eligibility criteria (UBNI in this case) be a discontinuous function at the “threshold” or cut-off point. Discontinuity around the threshold can be present as either: i) a jump in probability from 0 to 1, in which case sharp design applies; or ii) a smaller jump, in which case fuzzy design applies.

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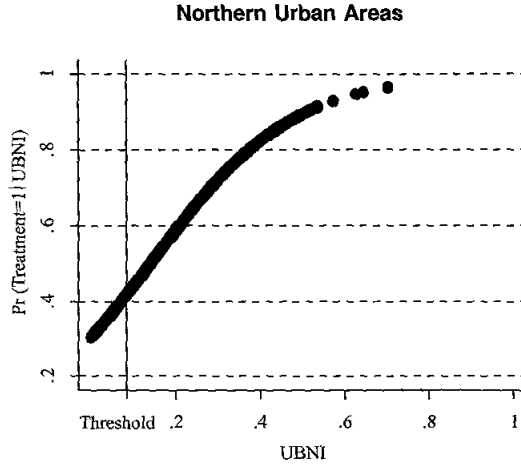
<sup>16</sup> It could also depend on the ability of households to modify their behavior in order to meet the requirements and be included in the program. With respect to *PANES*, this is not likely since UBNI includes variables that are difficult to alter by households.

In the above case, the presence of households that meet both criteria but do not receive the benefit, and vice versa, makes us think of fuzzy design. However, Figure 4 shows that there is no discontinuity in the probability of receiving the benefit based on UBNI, either around the threshold or at any other point.<sup>17</sup> Consequently, using RD to evaluate *PANES* is not plausible.

Figure 4  
 Probability of Receiving Citizen Income Benefit Based on UBNI



<sup>17</sup> Manacorda and Vigorito (2009) using non public *MIDES* information find a discontinuity in the threshold.



Source: Own elaboration using ECH 2006-2007 data.

For this reason, we opted for another quasi-experimental design, the propensity score matching estimator (PSM).<sup>18</sup> PSM imply matching each household that received assistance with a household of similar characteristics that did not receive assistance in order to make a robust comparison and reduce endogeneity bias. The difference between the variables of interest (or outcome) referring to the members of both households measures program impact.

The condition for identification is that, for certain explanatory  $X$  variables, the control group should be similar to the treatment group:

$$E[Y_0 | X, I=1] = E[Y_0 | X, I=0] = E[Y_0 | X]$$

where  $Y$  is the outcome variable (school attendance, child labor, labor market, participation),  $X$  represents the control variables,  $I=1$  indicates if the household is receiving transfers from a CCT and  $I=0$  if the household is not.

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<sup>18</sup> Heckman, Ichimura and Todd 1997.



The intuition behind PSM is the following. We begin by estimating a binary logit model to explain participation in *PANES*. This estimate gives us the probability of receiving treatment conditional on a set of household characteristics called propensity score  $p(X)$ . We compare households, with replacement and based on  $p(X)$ , which received treatment with other that did not. Thus, we calculate  $p(X)$  to estimate the counterfactual of non-treatment. We match households in  $p(X)$  and not directly in  $X$  because it is difficult to implement the matching estimator when  $X$  is large. In addition, Rosenbaun and Rubin (1983) proved that conditional independence for  $X$  implies conditional independence in  $p(X)$ .

Hence, the structure of the PSM estimator is as follows:

$$E \left[ Y_1 - Y_0 \mid \hat{p}(X) \right] = \frac{1}{N_1} \sum_{i \in T_1} \left[ Y_{1i} - \hat{E}(Y_{0i} \mid I_i = 1, p(X_i)) \right]$$

where

$$\hat{E} \left[ \hat{E}(Y_{0i} \mid I_i = 1, p(X_i)) \right] = \sum_{j \in T_1} W(i, j) Y_{0j} \text{ and } W(i, j) \text{ is a Kernel function}$$

One of the most important limitations of the PSM estimator is that the condition for identification does not allow selection in non-observables. However, PSM is an adequate method if we are able to control for a rich group of variables. The size of Uruguayan household surveys for 2006 and 2007 allows for a large number of control variables and observations, reducing the trade-off between bias and accuracy in the second stage of our PSM model.

Thus, the average treatment effect measures treatment impact (participating in *PANES*) on the group of households that received the benefit. The algorithm used to compare potential controls and treatment households is PSMATCH2, version 3.0 developed by Leuven and Sianesi (2003).

## 5. PANES Impact

The effects of *PANES* on school attendance, child labor and the labor market are quantified below. The evaluation considers 3 geographical areas: Montevideo, other urban areas and rural areas.

## 5.1 School attendance

Most conditional transfer programs use the cash benefit to encourage human capital accumulation. Typically, this type of intervention is justified by the existence of liquidity restrictions that prevent children in the household from attending school. If liquidity problems were the only determinant of non attendance to school, unconditional transfers would suffice to correct this market failure. However, parents might not be taking into account how their children could benefit when they make decisions regarding their education and thus, under invest in education. This means that other elements besides liquidity problems could be making this situation more complex.

Conditional benefits are an effective tool to increase school attendance levels as long as control mechanisms are in place to verify compliance; and schools are capable of handling the flow of new students. Even though *PANES* regulation makes school attendance mandatory for children in beneficiary households, it would actually be difficult to observe increased attendance due to the absence of control mechanisms and an undersupply of education.

### Outcomes

For school attendance we use a binary variable that takes the value of 1 if the child attends school and 0 if he does not. For the evaluation, children were grouped according to gender and age, using two age cohorts: 8-11 and 12-14. The age division was made taking into consideration that school dropout rates increase at age 11, that is, when children enter secondary school.

Outcomes for Montevideo and other urban areas show that there are no significant and quantitatively relevant effects on school attendance in either age group considered, both for boys and girls (see Table 9). To see whether differences are statistically significant, standard errors are calculated using the bootstrap method, based on 1,000 simulations. In addition, matching tests show that the treatment group and the control group have similar characteristics.<sup>19</sup>

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<sup>19</sup> Matching tests are included in the evaluation do-file.

**Table 9**  
**Average Treatment Effect on School Attendance**

Region	Age	Sex	Treated	Control	Difference	Boot. S.E.	z	P> z
Montevideo	8 a 11	Boys	0.986	0.997	-0.011	0.007	-1.590	0.113
	8 a 11	Girls	0.993	0.988	0.006	0.011	0.520	0.602
	12 a 14	Boys	0.861	0.906	-0.045	0.032	-1.480	0.138
	12 a 14	Girls	0.899	0.939	-0.039	0.030	-1.290	0.196
Other Urban Areas	8 a 11	Boys	0.996	0.994	0.002	0.004	0.440	0.658
	8 a 11	Girls	0.998	1.000	-0.001	0.001	-0.980	0.328
	12 a 14	Boys	0.893	0.838	0.055	0.027	2.010	0.045
	12 a 14	Girls	0.913	0.908	0.005	0.023	0.210	0.831
Rural Areas	8 a 11	Boys	0.996	0.993	0.003	0.006	0.510	0.610
	8 a 11	Girls	0.996	0.994	0.002	0.006	0.300	0.765
	12 a 14	Boys	0.813	0.733	0.080	0.046	1.740	0.082
	12 a 14	Girls	0.797	0.828	-0.021	0.046	-0.680	0.495

Bootstrap: Standard Errors based on 1,000 simulations.

Note: S.E. do not take into account that propensity scores were estimated.

Source: Own estimation based on ECH 2006-2007 data.

For rural areas a positive impact on school attendance is observed for boys between 12 and 14 years of age. The difference has statistical significance at 10% level. However, matching tests are not very solid. For rural areas, both the control group and the treatment group were defined based only on the income criterion since information on the cut-off point (or threshold) used to determine household eligibility in these areas based on UBNI is not public.

In general terms, outcomes show that PANES has not had a significant effect on increasing school attendance. This result is coherent with the design of the program, which despite the fact that it stipulates mandatory school attendance for beneficiary children, this requirement did not actually play a leading role. It is worth mentioning that school attendance levels for both boys and girls aged 8 to 11 were high before the intervention so positive effects would have been difficult to observe.

## 5.2 Child labor

Child labor can be divided in work outside the household and intensive work inside the household; strictly speaking, both constitute what is known as child labor. (Arim and Salas 2006). Strictly speaking, child labor includes children between the ages of 5 and 17 who carry out economic

activities according to the work related questions and the section on child labor included in *ECH* 2006. Intensive work inside the household is defined as household chores that can interfere with the development of the child. As regards child labor outside the household, both remunerated and non-remunerated activities are considered.

Children's time can be divided in time dedicated to school, child labor and leisure. The purpose of transfer programs is to increase the time children dedicate to their education by increasing school attendance. This would affect the time allocated to the three previously defined activities. Specifically, the desired redistribution would be changing working hours for study hours and not for leisure. In this case, no increased attendance is observed so if less time was allocated to work—child labor—beneficiaries would have had more leisure time.

## Outcomes

To quantify program impact on child labor, two different strategies were used. The first was analyzing the number of worked hours, by gender,<sup>20</sup> for each age group (14, 17) using the questions on working activities included in *ECH* 2006-2007. The target variable is the number of worked hours, theoretically, child labor outside the household. Based on this strategy, there are neither positive nor negative effects (see Table 10).

**Table 10**  
Average Treatment Effect on Child Labor  
Children Aged 14 to 17

Region	Sex	Treated	Control	Difference	Boot. S.E.	z	P> z
Montevideo	Boys	5.484	5.100	0.384	1.315	0.290	0.770
	Girls	1.983	2.354	-0.371	0.785	-0.470	0.637
Other Urban Areas	Boys	6.582	6.448	0.134	1.039	0.130	0.897
	Girls	2.422	2.001	0.421	0.677	0.620	0.534
Rural Areas	Boys	11.115	1.185	0.930	2.101	0.440	0.658
	Girls	2.714	2.682	0.032	1.111	0.030	0.977

*Bootstrap:* Standard Errors based on 1,000 simulations.

*Note:* S.E. do not take into account that propensity score was estimated.

*Source:* Own estimation based on la *ECH* 2006-2007 data.

<sup>20</sup> There are gender differences in child labor. Specifically, boys are more likely to work outside the household than girls (Arim and Salas 2007).

The second strategy uses data from the *ECH* 2006 Child Labor section. In this case, impact is measured as the number of worked hours within the household—intensive work within the household—, worked hours outside the household, and total worked hours—strictly speaking, child labor. Two age cohorts were established: (5-12) and (13-17); no distinctions were made based on sex or geographical area due to the reduced number of observations. Once again, there is no evidence of positive or negative impact (see Table 11).

**Table 11**  
**Average Treatment Effect on Child Labor in its Different Forms**

Variable	Age	Treated	Control	Difference	Boot. S.E.	z	P> z
Intensive child labor within the household	5 a 12	1.147	1.191	-0.042	0.325	-0.130	0.897
	13 a 17	1.998	2.030	-0.032	0.550	-0.060	0.954
Child labor outside the household	5 a 12	0.411	0.618	-0.207	0.184	-1.120	0.262
	13 a 17	0.898	0.422	0.475	0.356	1.330	0.182
Child labor strictly speaking	5 a 12	1.565	1.814	-0.249	0.372	-0.670	0.504
	13 a 17	2.896	2.452	0.443	0.657	0.670	0.500

Bootstrap: Standard Errors based on 1,000 simulations.

Note: S.E. do not take into account that the propensity score was estimated.

Source: Own estimation based on *ECH* 2006 data.

Outcomes observed for this section and for the previous section concerning the evaluation of school attendance indicate that PANES did not modify the time allocated by beneficiaries to school, child labor and leisure.

### 5.3 Labor supply, participation and informality

A negative effect of social assistance programs is the potential incentives they create to reduce the number of worked hours or to leave the labor force. Another possible outcome could be the migration of potential beneficiaries to the informal labor market (strategic behavior) that could be inferred from an increase in informality and no change in the number of worked hours. Hence, we evaluate program impact on the labor market, participation and informality to find out whether any of these circumstances occurred.

## Outcomes

Since labor market participation patterns differ according to gender, separate evaluations of the impact on the labor supply are made for men and for women. This impact will be evaluated based on the number of worked hours. Informality will be evaluated using a dummy variable that takes the value of 1 if individuals work in the informal market and 0 if they work in the formal labor market. Both for worked hours and for informality, we only consider individuals with positive worked hours. For participation, the target variable is a dummy that takes the value of 1 for economically active individuals (both employed and unemployed) and 0 for inactive individuals.

Our estimates find significant adverse effects for both men and women in urban areas other than Montevideo. In these areas, men who work and receive monetary assistance from *PANES* work at least 0.6 hours less per week and women 3 hours less per week. To put these figures in perspective, in this area, a reduction in the number of worked hours by men and women who participated in *PANES* is observed, around 1.4% for men and 8% for women. Matching tests for estimates made for the worked hours variable for urban areas other than Montevideo are included in Annex 1. They find similar characteristics between the treatment group and the control group. Mention must be made that effects on the labor market are only in terms of worked hours and not in terms of participation and that they are quantitatively smaller. No effects on informality are observed either.

As regards Montevideo, there is no clear evidence of impact on the different variables of interest considered in this section—worked hours, participation and informality—(see Annex 2).<sup>21</sup> For rural areas, negative effects are observed in terms of worked hours in addition to an increase in informal employment among men (see Table 12 and Annex 2, respectively). However, these outcomes are not conclusive because the control group does not have similar characteristics. We would like to mention once again that the lack of information on thresholds for these areas allows only a glimpse of the impact on the variables of interest.

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<sup>21</sup> Matching tests for these regions are included in STATA codes.

**Table 12**  
**Average Treatment Effect on Worked Hours**  
**Working Individuals Aged 22 to 55**

Region	Sex	Treated	Control	Difference	Boot. S.E.	z	P> z
Montevideo	Men	37.767	39.698	-1.931	1.411	-1.370	0.171
	Women	25.187	26.155	-0.968	1.983	-0.490	0.625
Other Urban Areas	Men	39.232	41.694	-2.462	0.934	-2.640	0.008
	Women	22.439	27.895	-5.456	1.307	-4.180	0.000
Rural Areas	Men	43.951	48.302	-4.351	1.152	-3.780	0.000
	Women	24.599	31.213	-6.615	2.043	-3.240	0.001

Bootstrap: Standard Errors based on 1,000 simulations.

Note: S.E. do not take into account that propensity score was estimated.

Source: Own elaboration based on ECH 2006-2007.

## 6. Conclusions and Lessons Learned

Outcomes show that in 2007, 27% of the eligible households in Montevideo and other urban areas were not able to enter *PANES*. In addition, less than 2% of the non-eligible households receive the Citizen Income benefit. These targeting indicators show noticeable improvements when compared to indicators for 2006. Also, it is shown that access thresholds for the different regions were only partially applied. This invalidates regression discontinuity to evaluate program impact.

As regards the evaluation, estimates show that *PANES* has not had a significant impact on student attendance or child labor. However, adverse effects on the labor market were found in terms of worked hours by men and women in urban areas other than Montevideo, where the program was mainly focused. Quantitatively, a reduction in the number of worked hours by men and women who participated in *PANES*, around 1.4% and 8%, respectively, was observed for this area. Mention must be made that the effect on the labor supply was only in terms of worked hours and not in terms of participation and that they are quantitatively low. No effect on the labor supply is observed for Montevideo or rural areas.

The absence of quantitatively significant *PANES* effects is not surprising since we can classify it as a hybrid between food and basic need programs and human capital development programs. Even though the act under which it was created includes the eligibility requirements, control mechanisms do not seem to have been effective, consistent with outcomes in terms of school attendance. It also reveals the need to strengthen the notion that the benefit is not permanent and that its role is helping people overcome indigence or poverty.

As for lessons learned, in the first place we would like to mention the significance of establishing eligibility criteria and evaluation mechanisms right from the beginning, gradually implementing the program to have adequate control groups. A second lesson is the reduced duration of *PANES* (two years). Outcomes indicate that effective interventions to reduce poverty are not possible in such a short period.

Even though conditional programs such as *PANES* seek to encourage education by making the benefit conditional on school attendance and regular medical examinations, the quantity and quality of education and health care centers must be improved for this increased demand to materialize. Effective monitoring to verify program requirements is also essential.

With respect to targeting mechanisms, setting a countrywide income ceiling without taking regional income and price differences poses the risk of geographical concentration. Additionally, the experiences of *PANES* indicate the need to improve program mechanisms designed to include the target population that adopts a passive role with respect to these policies.

Finally, we would like to point out that even though the purpose of *PANES* was to solve serious problems faced by Uruguayan society, such as indigence and poverty, the solution was only partial as a multiplicity of aspects such as employment, school attendance, health, child labor, etc., which are difficult to solve as a whole, were jointly addressed and through a program of short duration. Thus, we recommend focusing social policies on one single aspect (school attendance or child labor) to achieve better results and improve the allocation of social expenditure. We also recommend incorporating the evaluation design into the program since the very beginning.



## Annex 1

**Table 1**  
**Matching Test**  
**Worked Hours, Urban Areas Other Than Montevideo, Women**

Variable	Sample	Mean		t-test	
		Treated	Control	t	p> t
UBNI	Unmatched	0.239	0.214	4.270	0.000
	Matched	0.231	0.229	0.440	0.663
2006	Unmatched	0.604	0.693	-2.920	0.004
	Matched	0.619	0.628	-0.380	0.707
Family allowances	Unmatched	0.896	0.789	4.860	0.000
	Matched	0.894	0.896	-0.100	0.923
Comfort	Unmatched	0.193	0.222	-4.360	0.000
	Matched	0.195	0.218	-3.860	0.000
Healthh	Unmatched	0.001	0.000	0.730	0.466
	Matched	0.001	0.000	1.000	0.317
Members	Unmatched	1.672	1.645	1.260	0.208
	Matched	1.658	1.682	-1.360	0.173
Children <5	Unmatched	0.161	0.171	-0.430	0.668
	Matched	0.156	0.177	-1.020	0.308
Children >12 and <17	Unmatched	0.192	0.208	-0.640	0.524
	Matched	0.194	0.208	-0.630	0.526
Educational environment	Unmatched	2.227	2.556	-1.650	0.100
	Matched	2.254	2.560	-1.770	0.077
Sewage 1	Unmatched	0.061	0.043	1.270	0.206
	Matched	0.054	0.052	0.170	0.864
Sewage 2	Unmatched	0.268	0.243	0.920	0.358
	Matched	0.271	0.245	1.110	0.265
Sewage 3	Unmatched	0.639	0.693	-1.790	0.074
	Matched	0.648	0.674	-1.010	0.315
Sewage 4	Unmatched	0.031	0.021	0.940	0.346
	Matched	0.027	0.029	-0.030	0.761
Older adults >60	Unmatched	0.004	0.009	-1.090	0.274
	Matched	0.004	0.007	-0.800	0.422

**Table 2**  
**Matching Test**  
**Worked Hours, Urban Areas Other Than Montevideo, Men**

Variable	Sample	Mean		t-test	
		Treated	Control	t	p> t
UBNI	Unmatched	0.254	0.224	6.290	0.000
	Matched	0.252	0.252	0.020	0.983
2006	Unmatched	0.619	0.722	-4.420	0.000
	Matched	0.623	0.639	-0.790	0.472
Family allowances	Unmatched	0.866	0.772	5.140	0.000
	Matched	0.866	0.858	0.560	0.578
Comfort	Unmatched	0.196	0.217	-3.850	0.000
	Matched	0.197	0.202	-1.240	0.215
Healthh	Unmatched	0.002	0.000	1.030	0.302
	Matched	0.002	0.000	1.410	0.157
Members	Unmatched	1.735	1.670	3.840	0.000
	Matched	1.730	1.717	0.940	0.345
Children <5	Unmatched	0.179	0.199	-1.060	0.289
	Matched	0.179	0.219	-2.430	0.015
Children >12 and <17	Unmatched	0.159	0.156	0.170	0.861
	Matched	0.160	0.147	0.880	0.380
Educational environment	Unmatched	2.442	2.591	-0.980	0.330
	Matched	2.452	2.473	-0.170	0.868
Sewage 1	Unmatched	0.063	0.049	-1.680	0.094
	Matched	0.063	0.062	-1.290	0.196
Sewage 2	Unmatched	0.204	0.238	-1.680	0.094
	Matched	0.203	0.225	-1.290	0.196
Sewage 3	Unmatched	0.707	0.694	0.560	0.573
	Matched	0.707	0.685	1.140	0.256
Sewage 4	Unmatched	0.027	0.019	1.050	0.294
	Matched	0.027	0.028	-0.170	0.867
Older adults >60	Unmatched	0.003	0.009	-2.040	0.042
	Matched	0.003	0.006	-1.360	0.173

## Annex 2

**Table 1**  
**Average Treatment Effect on Labor Market Participation**  
**Individuals Aged 22 to 55**

Region	Sex	Treated	Control	Difference	Boot. S.E.	z	P> z
Montevideo	Men	0.737	0.709	0.029	0.032	0.900	0.367
	Women	0.488	0.520	-0.032	0.029	-1.090	0.276
Other Urban Areas	Men	0.748	0.737	0.011	0.021	0.530	0.595
	Women	0.468	0.483	-0.014	0.021	-0.700	0.482
Rural Areas	Men	0.740	0.749	-0.009	0.025	-0.360	0.720
	Women	0.362	0.364	-0.003	0.029	-0.090	0.928

Bootstrap: S.E. based on 1,000 simulations.

Note: S.E. do not take into account that propensity score was estimated.

**Table 2**  
**Average Treatment Effect on Informality**  
**Individuals Aged 22 to 55**

Region	Sex	Treated	Control	Difference	Boot. S.E.	z	P> z
Montevideo	Men	0.741	0.696	0.044	0.044	1.360	0.174
	Women	0.741	0.776	-0.035	0.037	-0.930	0.352
Other Urban Areas	Men	0.760	0.736	0.024	0.024	1.060	0.289
	Women	0.753	0.727	0.026	0.029	0.890	0.374
Rural Areas	Men	0.693	0.473	0.220	0.031	6.980	0.000
	Women	0.694	0.630	0.064	0.052	1.230	0.220

Bootstrap: S.E. based on 1,000 simulations.

Note: S.E. do not take into account that propensity score was estimated.

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